ACCESSION NR: AP4028997

conversion. A strong decrease in the extent of yield is observed within this same temperature range. These phenomena (also observed in other alloys) are associated with the prime orientation of regions which undergo a macroscopic shift during the conversion process under load caused by the very mechanism of the martensite conversion. This is confirmed by the observed change in orientation of the martensite crystal limitations under the effect of the applied stresses, as well as the possibility of an almost total restoration of the initial dimension of the sample. Orig. art. has: 6 figures.

ASSOCIATION: Institut metallofiziki AN SSSR (Institute of Metallophysics, AN SSSR)

SUBMITTED: 14May63 DATE ACQ: 27Apr64 ENCL: 00

SUB CODE: ML NO REF SOV: 009 OTHER: 008

Card 2/2

ACCESSION NR: AT4042833 S/2601/64/000/018/0054/0059

AUTHOR: Arbuzova, I. A., Kushnareva, N. P.

TITLE: The nature of the cellular structure in Ni-based heat resistant alloys

SOURCE: AN UkrSSR. Institut metallofiziki. Sbornik nauchny*kh rabot, no. 18, 1964. Voprosy* fiziki metallov i metallovedeniya (Problems in the physics of metals and physical metallurgy), 54-59

TOPIC TAGS: nickel based alloy, heat resistant alloy, gas turbine blade, blade surface coating, blade thermal fatigue test, blade surface cellular structure, crystallographic matrix plane, Laue method, gnomonic crystal projection, alloy structure

ABSTRACT: The authors discuss the cellular structure seen in the surfaces of gas turbine blades after thermal fatigue tests as the result of cracking of the surface coating (formed in the process of anodic etching) while it dries. They used the Laue procedure (back reflection, optical methods), constructed a gnomonic projection (see Fig. 1 in the Enclosure), found that the coating cracked along the crystallographic planes of the matrix (100), and

ACCESSION NR: AT4042833

conclude that a direct relationship cannot be traced between grain substructure and cellular structure, but that the evident congruence of the directions of coating cracks and crystallographic matrix planes is related to the existence of orientation congruence between them and the fact that cracking follows defined crystallographic planes in the coating. "The authors express gratitude to V. N. Gridnev for his constant interest and evaluation of the results." Orig. art, has: 2 tables, 3 microphotos and 1 graph.

ASSOCIATION: Institut metallofiziki AN UkrSSR (Metallophysics Institute, AN UkrSSR)

SUBMITTED: 19Feb63 DATE ACQ: 19Aug64 ENCL: 01

SUB CODE: MM, PR NO REF SOV: 004 OTHER: 004

Card 2/3

ACCESSION NR: AT4042833 ENCLOSURE: 01

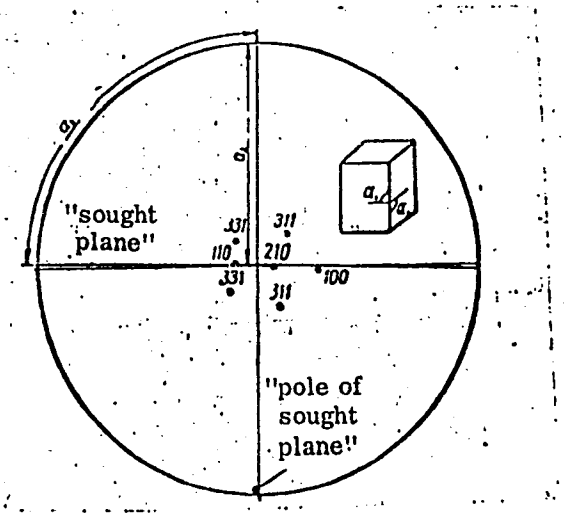


Fig. 1. Gnomonic projection of a crystal and the sought plane.

Card 3/3

ACCESSION NR: AT4042831 S/2601/64/000/018/0040/0046

AUTHOR: Arbuzova, I.A., Khandros, L. G.

TITLE: Effect of stress on deformation of an alloy of Cu, Al and Ni at martensitic transformation temperatures

SOURCE: AN UkrSSR. Institut metallofiziki. Sbornik nauchny*kh rabot, no. 18, 1964. Voprosy* fiziki metallov i metallovedeniya (Problems in the physics of metals and physical metallurgy), 40-46

TOPIC TAGS: copper alloy, copper aluminum nickel alloy, martensitic transformation, alloy deformation, deformation stress dependence, deformation temperature dependence, reversible deformation, permanent elongation, aluminum containing alloy, nickel containing alloy

ABSTRACT: Interrelationships between mechanical and thermal phenomena during martensitic transformation were studied on an alloy containing 8% Ni, 14% Al and 78% Cu. After forging and annealing (3 hrs., 900C), the samples were hardened by quenching from 900C in a caustic soda solution in water and polished at 70C to facilitate visual observation

Card 1/2

ACCESSION NR: AT4042831

of the transformation on the basis of surface relief. Results are plotted as stress-deformation and temperature-deformation curves and indicate that deformation increased nearly linearly with stress for small loads. Deformation receded as stress was reduced, to a permanent set of 0.2% (in this case). Heating to 56C reduced this further to a minor irreversible deformation related to relaxation processes. The angle of $\sigma = f(\varepsilon)$ curves for the range 0-56C is governed basically by the temperature discrepancy from the martensitic transformation point, which also affects the magnitude of the residual elongation. Orig. art. has: 5 figures.

ASSOCIATION: Institut metallofiziki AN UkrSSR (Metallophysics Institute, AN UksSSR)

SUBMITTED: 16Mar63 ENCL: 00

SUB CODE: MM NO REF SOV: 003 OTHER: 000

Card 2/2

ARBUZOVA, I.A.; KHANDROS, L.G.

Effect of stresses on the deformation of alloys of copper with aluminum and nickel in the temperature range of the martensite transformation. Sbor. nauch. rab. Inst. metallofiz. AN URSR no.18:40-46 '64
(MIRA 17:8)

ARBUZOVA, I.A.; KUSHNAREVA, N.P.

Nature of cellular structure in nickel-base heat-resistant alloys. Sbor. nauch. rab. Inst. metallofiz. AN URSR no.18: 54-59 '64

L 194 65 EWT m EPF(c) EWP(j)/T Pc-4/Pr-4 ASD(m)-3/AS(mp)-2 RM
ACCESSION NR: AP4032566 S/0190/64/006/004/0662/0665

AUTHORS: Arbuzova, I. A.; Plotkina, S. A.

TITLE: Cyclic polymerization of diallylmaleate

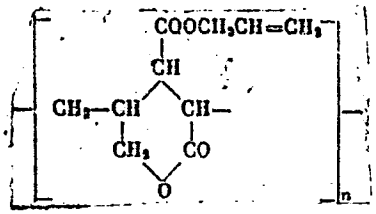
SOURCE: Vy*sokomolek. soyedin., v. 6, no. 4, 1964, 662-665

TOPIC TAGS: diallylmaleate, cyclic polymerization, polydiallylmaleate, lactone unit, linear polymer, cyclization, polymonoallylmaleate, allylic bond, maleic bond, intermolecular interaction, intramolecular interaction

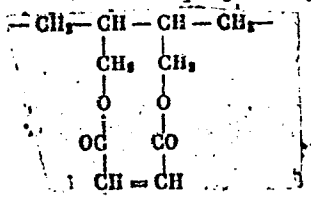
ABSTRACT: The present investigation is a continuation of earlier work by the authors on bulk polymerization of monoallyl esters of maleic and citraconic acids in the presence of benzoyl peroxide (Vy*sokomolek. soyed., 4, 844, 1962), which revealed the formation of linear polymers containing cyclic units, as a result of intermolecular and intramolecular interaction of double bonds. In the present study samples of diallylmaleate were subjected to bulk polymerization in sealed ampules for 2 hours at 80C in the presence of benzoyl peroxide. A polydiallylmaleate with a 33-33.4% total unsaturation, corresponding to one double bond per polymer unit, was produced, with the allyl alcohol groups constituting 31-31.4%. The following formula is suggested for the polymer:

Card 1/3

L 20794-65
ACCESSION NR: AP4032566



Since analysis also revealed the presence in the polymer of 2% unsaturated maleic bonds, another structural pattern for the polydiallylmaleate was suggested:



When an aliquot of the polydiallylmaleate was saponified for 3-4 hours with 0.5 normal sodium hydroxide and neutralized with hydrochloric acid, a precipitate was obtained, which proved to have the structure

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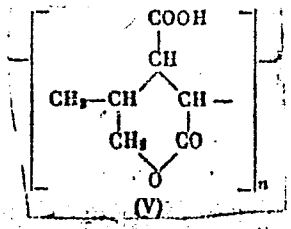
L 20794-65
ACCESSION NR: AP4032566



(V)

corresponding to the structure of polymonoallylmaleate. It is thus evident that the linear polymer of diallylmaleate consists of lactone units containing unsaturated groups, the cyclization having taken place as the result of interaction of the maleic and allylic double bonds. Orig. art. has: 3 formulas.

ASSOCIATION: Institut vy*sokomolekulyarny*kh soyedineniy AN SSSR (Institute of High-Molecular Compounds, AN SSSR)

SUBMITTED: 24Apr63 ENCL: 00

SUB CODE: GC, OC NO REF SOV: 003 OTHER: 002

Card 3/3

ZAKHAROV, S.K.; MEDVEDEVA, L.I.; ARBUZOVA, I.A.; KUVSHINSKIY, Ye.V.

Softening, high-elastic resilience, and structure of space-polymers of methyl methacrylate and styrene with diolefinic monomers. Vysokom. soed. 7 no.9:1554-1561 S '65.
(MIRA 18:10)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.

L 8860-66 EWT(m)/EWP(j)/T WW/RM

ACC NR: AP5025966 SOURCE CODE: UR/0190/65/007/010/1792/1795

AUTHOR: Rostovskiy, Ye. N.; Lis, A. L.; Arbuzova, I. A.

ORG: Institute of Macromolecular Compounds, AN SSSR (Institut vysokomolekulyarnykh soyedineniy AN SSSR)

TITLE: Cyclic polymerization of glycidyl crotonate

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 10, 1965, 1792-1795

TOPIC TAGS: organic chemical, polymerization, catalytic polymerization, radical polymerization, polymer structure, linear polymer, reaction mechanism, epoxy plastic

ABSTRACT: The synthesis and properties of polyglycidylcrotonate were investigated. Polymerization attempted in the presence of tert. butylperoxide as radical initiator gave, after prolonged heat treatment at 120°, only a 35% yield of a polymer containing double bonds and epoxide groups. In the presence of the cationic catalyst boron fluoride etherate glass, linear or three-dimensional polymers, stable at 130 and 150°, were obtained. From chemical analyses, IR spectral data, and polymer properties it was concluded the polymerization was effected by the reaction of a crotonic bond and the alpha-oxide ring to form

Card 1/2 UDC: 66.095.26+678.744

L 8860-66

ACC NR: AP5025966

cyclic polymers. Possible reaction mechanism for this polymerization is discussed. Orig. art. has: 1 figure and 1 equation.

SUB CODE: OC/ SUBM DATE: 23Nov64/ ORIG REF: 003/ OTH REF: 001

BVK

Card 2/2

L 27673-66 EWT(m)/T/EWA(d)/EWP(t)/ETI IJP(c) JD/GD

ACC NR: AT6013832 SOURCE CODE: UR/0000/65/000/000/0078/0084

AUTHOR: Arbuzova, I. A.; Zapal, V. V.

ORG: Institute of Metal Physics, AN UkrSSR (Institut metallofiziki AN UkrSSR)

TITLE: Study of the substructure of ZhS-6K alloy

SOURCE: AN UkrSSR. Issledovaniye nesovershenstv kristallicheskogo stroyeniya (Study of imperfections in crystal structure). Kiev, Naukova dumka, 1965, 78-84

TOPIC TAGS: polygonization development, metal heat treatment, crystal structure, solid solution, alloy, heat effect

ABSTRACT: The substructure of crystals of the solid solution of ZhS-6K alloy was studied by x-ray diffraction after various heat treatments. The effect of the temperature to which the cast specimens were heated (950, 1050, 1300C and holding for 4 hr at each temperature) on the diffraction pattern was determined. Heating to 950 did not change the type of reflections from most grains. After heating to 1050C, Laue patterns with a marked splitting of spots were observed for most grains. Heating to 1300C caused a further splitting of the reflections. As the holding time and temperature of the heating were increased, the degree of disorientation of the subgrains also increased (a simultaneous growth of the subgrains is possible). The degree of development of the substructure was different in different grains. It was found that heat treatment of certain cast parts made of ZhS-6K alloy (1200C - 4 hr - air) causes the polygonization of the grains. As the specimens were heated in the 950—1300C

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L 27673-66
ACC NR: AT6013832

range and in the course of isothermal soaking at 1200C, the character of the substructure changed (in particular, the degree of disorientation of the subgrains increased). Orig. art. has: 3 figures.

SUB CODE: 11,07 / SUBM DATE: 30Oct64 / ORIG REF: 004 / OTH REF: 005

Card 2/2 CC

SULTANOV, K.; ARBUZOVA, I.A.

Polymerization of diene acetals; divinyl-allylvinyl-and diallylacetal. Uzb. khim. zhur. 7 no.4:58-63 '63.
(MIRA 16:10)

1. Institut khimii polimerov AN UzSSR.

ARBUZOVA, I.A.; MEDVEDEVA, L.I.; ZAKHAROV, S.K.

Synthesis of glycol esters of methacrylic acid. Zhur. prikl. khim. 36 no.8:1833-1837 Ag '63. (MIRA 16:11)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.

ARBUZOVA, I.A.; MOSEVICH, I.K.

Polymerization of dibenzalacetone. Vysokom. soed. 6 no.1: 13-15 Ja'64. (MIRA 17:5)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.

ARBUZOVA, I.A.; PLOTKINA, S.A.

Cyclic polymerization of diallyl maleate. Vysokom. soed. 6 no.4:662-665 Ap '64. (MIRA 17:6)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.

L 1155-66 EWT(m)/EPF(c)/EWP(j)/T RM

ACCESSION NR: AP5022006 UR/0286/65/000/014/0077/0077
678.744.002.2

AUTHOR: Rostovskiy, Ye. N.; De-Millo, L. Ye.; Budovskaya, L. D.; Arbuzova, I. A.

TITLE: A method for producing polyvinyl alcohol. Class 39, No. 172991

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 14, 1965, 77

TOPIC TAGS: polyvinyl alcohol, redox reaction, polymerization initiator

ABSTRACT: This Author's Certificate introduces a method for producing polyvinyl alcohol by bulk polymerization of vinyl formate under the action of initiators and then washing the resultant polymer in a water-alcohol solution of an alkali. The properties of the product are improved by using an organic peroxide-α-aminosulfonetertiary amine redox system as the process initiator.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High Molecular Compounds, AN SSSR)

SUBMITTED: 16May63 ENCL: 00 SUB CODE: MT,OC
NO REF SOV: 000 OTHER: 000

Card 1/1 DP

L 1579-66 EWT(m)/EPF(c)/EWP(j)/T RPL WW/RM

ACCESSION NR: AP5022601 UR/0190/65/007/009/1554/1561
678.01:53+678.744+678.746

AUTHORS: Zakharov, S. K.; Medvedeva, L. I.; Arbuzova, I. A.; Kuvshinskiy, Ye. V.

TITLE: Softening, rubber-like elasticity, and structure of three-dimensional polymers of methyl methacrylate and styrene with diolefinic monomers

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 9, 1965, 1554-1561

TOPIC TAGS: polymer, elastic deformation, methyl methacrylate, styrene, olefin, thermomechanical property

ABSTRACT: Thermomechanical and elastic-deformational properties of three-dimensional copolymers (solid at room temperature) were investigated, and their structure was analyzed. The materials selected for study were prepared by a radical copolymerization of methyl methacrylate or styrene with methacrylic anhydride, dimethyl ethylene glycol, 1,4-butyleneglycol dimethacrylate, or 1,5-diethyleneglycol dimethacrylate, using benzoyl peroxide as an initiator. Thermomechanical studies were performed according to the method described by the authors in an earlier work (Zavodsk. lab., 30, 1399, 1964). Change in elastic deformation of copolymers was observed as a temperature function of the modulus of normal

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L 1579-66

ACCESSION NR: AP5022601

elasticity. It was found that the magnitude of the "equilibrium" elasticity modulus is a function of the nature of the principal monomer, its molecular weight, number of single bonds along the monomeric chain of the cross-linking agent, and the molar content ν of the latter. The softening point of the copolymers is a direct linear function of ν. Possible structures for these materials, based on the information of their chemical composition, are discussed. Comparative evaluation of the number of chains of ideal lattices with effective number of chains of a real lattice shows that the softening temperature of the three-dimensional polymers under discussion is directly related to the effective number of chains per 1 cc of the polymer. Orig. art. has: 6 figures, 1 table, and 2 formulas.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy, AN SSSR (Institute of High-Molecular Compounds, AN SSSR)

SUBMITTED: 16Oct64 ENCL: 00 SUB CODE: OC

NO REF SOV: 007 OTHER: 016

Card 2/2

L 60138-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 JAJ/RM

ACCESSION NR: AP5016505 UR/0190/65/007/006/1024/1026
541.64

AUTHORS: Arbuzova, I. S.; Yefremova, V. N.; Fedorova, Ye. F.; Yeliseyeva, A. G.; Zinder, M. F.

TITLE: Synthesis of reactive polymers. A study of the addition of the epoxide ring to the carboxyl group of polymers

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 6, 1965, 1024-1026

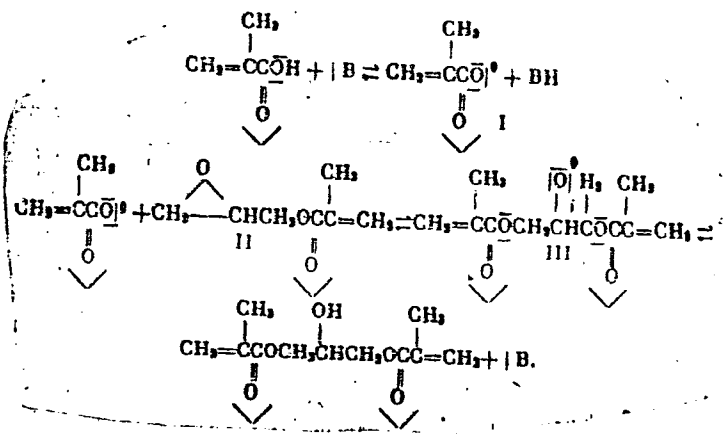
TOPIC TAGS: polymer, resin, epoxide, methacrylate, copolymerization / Nippon Bunko infrared spectrophotometer

ABSTRACT: The copolymerization products of glycidylyl methacrylate and methacrylic acid were synthesized in order to study the reaction of the epoxy ring with the carboxyl group of the copolymer. Glycidylyl methacrylate was synthesized after I. A. Arbuzova, V. N. Yefremova, A. G. Yeliseyeva, and M. F. Zinder (Vysokomolek. soyed., 5, 1819, 1963). The reaction was carried out at 120-140C. From IR spectra of the heated copolymer it is concluded that an addition reaction takes place between the epoxy ring and the carboxyl group, as shown by

Card 1/3

L 60138-65

ACCESSION NR: AP5016505



The structure of the cross-linking bridge was determined by IR spectroscopy of the copolymer of glycidylyl methacrylate and methacrylic acid, and was confirmed by a similar study of the IR spectra of glycyldimethacrylate synthesized by the action of methacrylic acid on glycidylyl methacrylate in the presence

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L 60138-65
ACCESSION NR: AP5016505

of pyridine and phenyl-β-naphthylamine. Orig. art. has: 2 graphs and 1 illustration.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute for High-Molecular Compounds, AN SSSR)

SUBMITTED: 10Jul64 ENCL: 00 SUB CODE: OC

NO REF SOV: 003 OTHER: 001

Card 3/3

PATRIKEYEV, V., starshiy nauchnyy sotrudnik; ARBUZOVA, K., mladshiy nauchnyy sotrudnik

Paste for cleaning metal surfaces from rust and fouling.
Mor.flot 22 no.4:28-29 Ap '62. (MIRA 15:4)

1. Institut organicheskoy khimii AN SSSR (for Patrikeyev).
2. Institut okeanologii AN SSSR (for Arbuzova).
(Ships--Maintenance and repair) (Fouling of ship bottoms)

Arbuzova, K. S.

ARBUZOVA, K.S.

Effect of green manure on the development of benthos and overgrowth fauna on the "IAmat" Fish Spawning and Rearing Farm. Trudy VNIRO 32:54-64 '56. (MIRA 10:10)
(Volga Delta--Fish ponds)
(Fresh-water flora)

ARBUZOVA, K. S., Cand Biol Sci -- (diss) "Effect of environmental conditions upon the respiration of the basic organisms of overgrowth in the Black Sea." Mos-Len, Pub House Acad Sci USSR, 1958. 16 pp with graphs (Acad Sci USSR, Inst of Oceanology), 110 copies (KL, 16-58, 118)

17(4), 18(7)
AUTHOR: Arbuzova, K. S.

SOV/2o-127-2-65/7o

TITLE: On the Permeability of the Shell Basis of Balanus improvisus Darvin

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 2, pp 462 - 464 (USSR)

ABSTRACT: The operation of ships at sea and various hydrotechnical constructions are considerably disturbed by the covering of plant and animal organisms. This leads to economic losses. The corrosion of metals is also favored y this factor (Ref 5). This problem has hitherto not been sufficiently investigated in spite of its topicality. Local corrosion places were found under the shells of dead Balanus (barnacles) (Refs 6,7), whereas no corrosion was found under living barnacles and other organisms. It was tried to explain this difference by the effect of the decomposition products of the dead barnacles on the metal. It remains, however, unclear how these products reached the metal surface since the publications known to the author do

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not contain any data on the problem mentioned in the title. This led to the investigation of this problem in 1958. Labelled atoms were used here: $Ca^{45}Cl_2$. The barnacles were detached from sea mussel shells (Mytilus edulis) with their intact sole (base) which was proved under the binocular microscope. 12 living barnacles formed the experimental group (I), barnacles with intentionally injured soles served as controls. Group (II) consisted of artificially killed barnacles (18) the decomposition of which took 7 - 2o days. The upper part of all barnacles was covered with paraffin by their opercular aperture in order to prevent Ca^{45} from penetrating into their shell. The experimental objects were put into sea water with solved Ca^{45} and an activity of 72 μ Cu/l for 1 or 6 hours. After the experiment they were carefully rinsed with Ca-isotopes and the following preparations were produced from them: 1) Barnacle bodies, 2) walls of the shell, 3) operculum, and 4) sole of the shell. The author draws the following conclusions from the results: 1) The sole of the shell is impermeable to the Ca^{45} solved in sea water. It must be assumed that this holds also in the case of the decomposition products of the barnacle body.

On the Permeability of the Shell Basis of Balanus improvisus Darvin SOV/2o-127-2-65/7o

Therefore the metal corrosion cannot be caused by these products. 2) The decomposition products produced when barnacles with closed operculum die dissolve gradually the thin parts of the sole of the shell, thus rendering the latter permeable to the radioactive solution as well as to the decomposition products of the barnacle body. The occurrence of the latter on the metal surface may favor its corrosion. 3) The permeability of the sole may be observed 14-2o days after the barnacles with closed operculum died. There are 6 references, 5 of which are Soviet.

ASSOCIATION: Institut okeanologii Akademii nauk SSSR (Institute of Oceanography of the Academy of Sciences, USSR)

PRESENTED: April 3, 1959, by Ye. N. Pavlovskiy, Academician

SUBMITTED: April 2, 1959

Card 3/3

S/020/60/132/03/57/066
B011/B005

18.8300

AUTHORS: Arbuzova, K. S., Patrikeyev, V. V.

TITLE: The Role of Balanus in the Corrosion of Stainless Steel in the Black Sea

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 3, pp. 693 - 695

TEXT: In previous papers dealing with the same subject (Refs. 1-8) there was no convincing proof that barnacles influence the corrosion of various steel types. The authors wanted to clarify by experiments the causes of corrosion of stainless steel under the barnacles attached to it: 1) They made experiments with marble plates in which electrochemical corrosion was eliminated. 2) To clarify the formation of interspaces between the barnacle shell and the base, experiments were made with plates of stainless steel of the type 1X18H9T (1Kh18N9T) and of glass. The plates were placed into sea water in the port of Batumi for 6 months. The barnacle species clinging to the plates were Balanus improvisus Darwin and B. eburneus Gould. The authors investigated 10,630 partly living, partly dead barnacles

The Role of Balanus in the Corrosion of Stainless Steel in the Black Sea

S/020/60/132/03/57/066
B011/B005

on steel plates. Corrosion was found on 0.15%. The authors believe that the products of metabolism and decomposition of dead barnacles lose their acid properties after having been secreted into the water. The base is not influenced by these products. The authors found a close attachment of barnacles to the base. They used for this purpose the luminescence defectoscopy. The side of the glass plates covered with barnacles was colored with lumogen, water light-blue (aqueous solution) and lumogen, light-yellow (dissolved in benzine). The steel plates were nickel plated for the same purpose. The plates colored with lumogen were investigated in the laboratory luminoscope under the radiation of a quartz lamp. The gaps found under the barnacle shells corresponded to a great extent to the corrosion spots on the steel plates. Some copper was precipitated onto the previously nickeled steel plates. This made the metal precipitate particularly well visible. This metal precipitate had penetrated both the automatically formed interspaces and the artificially made ones (by means of a needle). Four types of interspaces were observed. Altogether, 0.15 - 0.3% of the gaps had formed naturally under the shells. The sea water enters the gaps, and produces an electrochemical corrosion of the steel plates. No other form of corrosion could be found. The authors could not observe any

4

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The Role of Balanus in the Corrosion of Stainless Steel in the Black Sea

S/020/60/132/03/57/066
B011/B005

corrosion under other organisms clinging to objects in the sea: Bryozoa and Serpulidae. Apparently, no gap is formed between them and their base. There are 10 references, 8 of which are Soviet.

ASSOCIATION: Institut okeanologii Akademii nauk SSSR (Institute of Oceanology of the Academy of Sciences, USSR). Institut organicheskoy khimii Akademii nauk SSSR (Institute of Organic Chemistry of the Academy of Sciences, USSR)

PRESENTED: December 6, 1959, by A. A. Balandin, Academician

SUBMITTED: December 2, 1959

Card 3/3

ARBUZOVA, K.S.

Effect of fouling caused by macroscopic organisms on the corrosion of steel in the Black Sea. Trudy Inst. okean. 49:266-273 '61. (MIRA 15:1)

(Black Sea--Marine fouling) (Steel--Corrosion)

ARBUZOVA, K.S.; PATRIKEYEV, V.V.

The attachment apparatus of the rock barnacles Balanus improvisus Darwin and B. eburneus Gould of the Black Sea. Okeanologiia 1 no.4:688-690 '61. (MIRA 14:11)

1. Institut okeanologii AN SSSR.
(Black Sea--Cirripedia)

KARAYEVA, N.I.; ARBUZOVA, K.S.

Materials on the diatoms of fouling on the eastern coast of the Caspian Sea; preliminary report. Trudy Inst. okean. 70:29-40 '63. (MIRA 17:7)

ARBUZOVA, K.S.

Fouling in the southeastern part of the Baltic Sea; preliminary report. Trudy Inst. okean. 70:41-51 '63. (MIRA 17:7)

ACC NR: AP7004390 (A) SOURCE CODE: UR/0226/67/000/001/0001/0013

AUTHOR: Litvintsev, A. I.; Arbuzova, L. A. (Kuybyshev)

ORG: none

TITLE: Degassing kinetics of aluminum powders

SOURCE: Poroshkovaya metallurgiya, no. 1, 1967, 1-13

TOPIC TAGS: POWDER METAL COMPACTION, ADSORPTION, aluminum powder, ~~aluminum powder~~ degassing, ~~compacted powder degassing~~, degassing kinetics/APS-1 powder, APS-3 powder

ALUMINUM ALUMINUM

ABSTRACT: APS-1 and APS-3 aluminum powders containing 7 and 15% aluminum oxide, respectively, with a gas content of 476 $cm^3/100$ g, were degassed in air at 400, 600 and 700C, or in an argon atmosphere at 400, 600 and 640C for 1 hr. For comparison, APS-3 powder with an initial gas content of 950 $cm^3/100$ g also was degassed in an argon atmosphere at 640C for 1 hr. The degassed powders were cooled in the degassing media and then compacted to preserve their gas content. Portions of APS-1 powder degassed in air were also held for 24 hr in air with a relative humidity of 80 and 100% and then compacted to preserve their gas content. Portions of APS-1 and APS-3 powders degassed in argon were held in air with a relative

Card 1/2 UDC: none

ACC NR: AP7004390

humidity of 80--83% for 24 and 42 days and then in air with a relative humidity of 100% for 200 hr. Degassing with heating in air had no effect on the ability of the powder surface to re-adsorb moisture, but degassing with heating in argon (at 640C) pratically eliminated the subsequent moisture re-adsorption, even at a relative humidity of 100%. The kinetics of degassing aluminum powders were found to be associated with polymorphic transformations of aluminum-oxide trihydrate, which depend on the annealing temperatures. The polymorphic transformations of the trihydrate oxide of aluminum powders with heating is associated with the liberation of both moisture and hydrogen. Annealing at temperatures up to 450—550C changes the trihydrate state of the oxide film into the $Al_2O_3 \cdot H_2O$ monohydrate (boehmite). In the boehmite state the oxide film of aluminum powders is the most hygroscopic because of the active chemisorption of moisture. The amount of chemisorbed moisture on the boehmite surface of the aluminum powder and of physically adsorbed moisture at the γ-condition depends on the seasonal moisture of the atmosphere. Liberation of hydrogen is the result of the interaction between the adsorbed moisture and the water of hydration and the aluminum surfaces exposed with heating, and also of aluminum atoms diffusing through oxide film. The interaction between moisture and aluminum can begin at 80—90C. Orig. art. has: 7 figures and 5 tables. [MS]

SUB CODE: 11/ SUBM DATE: 29Apr66/ ORIG REF: 016/ OTH REF: 008
ATD PRESS: 5116

Card 2/2

LYUBICH, F.P. [deceased]; ARBUZOVA, L.Ya.

Biological significance of the aquatic adventitious roots in Phragmites communis Trin. Bot. zhur. 49 no.9:1299-1301 S '64. (MIRA 17:12)

1. Nauchno-issledovatel'skiy institut po ispol'zovaniyu trostnika v promyshlennosti i stroitel'stve, Astrakhan'.

Arbuzova, M. P.

USSR/Organic Chemistry - Synthetic Organic Chemistry E-2

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 4297

Author : Pudovik, A.N., Arbuzova, M.P.
Inst : Kazan University
Title : Synthesis and Isomerization of Phenol Ethers of Ethoxy- and Butoxypentenols

Orig Pub : Uch. zap. Kazanskogo un-ta, 1956, 116, No 1, 136-140

Abstract : Study of interaction of $ROCH_2CH_2CH\ CHCH_2Cl$ (I) R = C_2H_5 or C_4H_9, and $C_2H_5OCH_2CH_2CHClCH{=}CH_2$ (II) with C_6H_5OH (III) and KOH. In aqueous media I and II form $ROCH_2CH_2CH{=}CHCH_2OC_6H_5$ (IV). In acetone solution II yields, in addition to IV (R = C_2H_5), also $C_2H_5{-}OCH_2CH(OC_6H_5)CH{=}CH_2$ (V).

Card 1/3 - 43 -

USSR/Organic Chemistry - Synthtic Organic Chemistry

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 4297

E-2

Evidently in aqueous medium II reacts according to the monomolecular mechanism with complete allylic rearrangement, while in acetone it reacts according to a mixed mono- and bimolecular mechanism with a partial rearrangement. On thermal isomerization IV ($R = C_2H_5$) is converted to o-$HOC_6H_4(CH{:}CH_2)CH_2CH_2OC_2H_2$, and V to

o-$HOC_6H_4CH_2CH{=}CHCH_2CH_2OC_2H_5$ (VI). Structure of IV ($R = C_2H_5$) is proven by its oxidation to beta-ethoxypropionic (VII) and phenoxyacetic (VIII) acids. Structure of V is confirmed by obtaining therefrom, following ozonation, CH_2O. Structure of VI is proven by its oxidation to VII and synthesis by direct C-alkylation of C_6H_5ONa with I ($R = C_2H_5$) in C_6H_6 (boiling for 6 hours).

To 22.1 g melted III are added 13.2 g KOH in 20 ml water

Card 2/3

ARBUZOVA, M.S.

Some new data on the mechanism of the movement of the blood through the liver. Nauch. trudy Kaz. gos. med. inst. 14:79-80 '64.
(MIRA 18:9)

1. Kafedra operativnoy khirurgii i topograficheskoy anatomii (zav. - prof. V.Kh.Frauchi) Kazanskogo meditsinskogo instituta.

ARBUZOVA, M.S., assistent

Portal hypertension and portacaval anastomosis in an experiment. Kaz.med.zhur. no.3:30-33 My-Je '62. (MIRA 15:9)

1. Kafedra operativnoy khirurgii i topograficheskoy anatomii (zav. - prof. M.M.Shalagin [deceased]) Kazanskogo meditisinskogo instituta.
(PORTAL HYPERTENSION) (PORTACAVAL ANASTOMOSIS)

ARBUZOVA, M.S.

Experimental data on intraorganic circulation in the liver of dogs. Eksper. khir. i anest. 7 no.4:21-27 Jl-Ag '62. (MIRA 17:5)

1. Iz kafedry operativnoy khirurgii i topograficheskoy anatomii (zav. - prof. M.M.Shalagin [deceased]) Kazanskogo meditsinskogo instituta.

L 57122-65 EWT(d)/T/EWP(1) Pg-4 IJP(c)
ACCESSION NR: AP5013436 UR/0020/65/162/001/0033/0035

AUTHOR: Arbuzova, N. I.; Danilov, V. L.

TITLE: One problem of stochastic linear programming and its stability

SOURCE: AN SSSR. Doklady, v. 162, no. 1, 1965, 33-35

TOPIC TAGS: linear programming, programming

ABSTRACT: It is required to minimize this linear function $F(x)$, $x = x_1, \ldots, x_n$, with these linear constraints: $\sum_j a_{ij}x_j \leqslant b_i(\xi)$, $i = 1, \ldots, m$, where $b_i(\xi)$ are independent random quantities having a mathematical expectation b_i and dispersion σ_i^2. A stochastically modulus- ε -stable solution of the convex-programming problem is sought. The problem can be solved on a computer in an once-through manner: a solution on the average, stability analysis, isolation of A-matrix, and finding A^{-1} matrix. The practical applications of the above programming problem include: Determination of optimal production capacity on the basis of a statistical prognosis of consumption; determination of optimal mining of raw materials on the basis of a probabilistic estimate of prospective reserves; etc. Orig. art. has: 6 formulas.

Card 1/2

L 57122-65
ACCESSION NR: AP5013436

ASSOCIATION: Vsesoyuznyy neftegazovyy nauchno-issledovatel'skiy institut (All-Union Petroleum and Gas Scientific Research Institute)

SUBMITTED: 22Oct64 ENCL: 00 SUB CODE: DP

NO REF SOV: 002 OTHER: 003

Card 2/2

ARBUZOVA, N.N., starshaya meditsinskaya sestra

Massage and gymnastics for infants. Med. sestra no.5:6-16 My '61.
(MIRA 14:6)

1. Iz fizioterapevticheskikh kabinetov Detskoy bol'nitsy imeni N.K.Krupskoy, Leningrad.
(MASSAGE) (PHYSICAL EDUCATION FOR CHILDREN)

ARBUZOVA, S.K.

Mineralogical description of lead and silver deposits of Kan-I-Mansur (Tajik S.S.R.). Izv. Otd. est. nauk AN Tadzh.SSR no.19: 7-16 '57. (MIRA 11:8)

1. Institut geologii AN Tadzhikskoy SSR.
(Tajikistan--Mines and mineral resources)

ARBUZOVA, S.K.

Colloform ores of the Darayso deposit(Tajikistan). Dokl. AN Tadzh. SSR no. 20:33-36 '57. (MIRA 11:7)

1. Institut geologii AN Tadzhikskoy SSR. Predstavleno chlenom-korrespondentom AN Tadzhikskoy SSR R.B.Baratovym.
(Darvaza Range--Ore deposits)

ARBUZOVA, S.K.

Discovery of plattnerite in Tajikistan. Dokl.AN Tadzh.SSR 1 no.4:11-13 '58. (MIRA 13:4)

1. Institut geologii AN Tadzhikskoy SSR. Predstavleno AN Tadzhikskoy SSR R.B.Baratovym.
(Karamazor Mountains--Plattnerite)

ARBUZOVA, S.K.

Mineralogy of the Kondara and Diamalik lead-fluorite deposits. Trudy AN Tadzh.SSR 104 no.1:85-92 '59. (MIRA 15:4)

1. Institut geologii AN Tadzhikskoy SSR.
(Gissar Range—Mineralogy)

RUKAVISHNIKOVA, I.A. [deceased]; KOLESNIKOV, V.V.; ARBUZOVA, S.K.

Twins of cerussite from the Kaskaygyr deposit in central Kazakhstan. Kora vyvetr. no. 3:67-71 '60. (MIRA 13:12)

1. Institut geologii rudnykh mestorozhdeniy, petrografii, mineralogii i geokhimii AN SSSR.
(Kazakhstan--Cerrusite crystals)

ARBUZOVA, S.K.

Effect of the mineralogical composition of loess soils on their engineering properties. Izv.vys.ucheb.zav.; geol. i razv. 7 no.3: 105-109 Mr '64. (MIRA 18:3)

1. Volgogradskiy institut inzhenerov gorodskogo khozyaystva.

ARKUZOVA, S.K.

Relation of the mineralogical composition of rocks to the degree of their dispersion. Izv.vys.ucheb.zav.; geol.i razv. 8 no.11:103-109 N '65. (MIRA 18:12)

1. Volgogradskiy institut inzhenerov gorodskogo khozyaystva.

ARBUZOVA. T. Kh.

Arbuzova, T. Kh. "A case of neosalvarsan polyneuritis," Sbornik nauch. trudov Kliniki nerv, bolezney (Yerevansk. gos. med. in-t), I-II, 1948, p. 495-502 -- In Armenian Summary in Russian

So: U-3566, 15 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 13, 1949)

KASHIRSKIY, V.G.; Prinimali uchastiye: ARBUZOVA, T.K., laborant; SULTANOVA, G.V., laborant

Production of aromatic hydrocarbons by the pyrolysis of powdered peat. Izv.vys.ucheb.zav.;khim.i khim.tekh. 4 no.4:661-664 '61. (MIRA 15:1)

1. Saratovskiy avtodorozhnyy institut i Nauchno-issledovatel'skiy institut khimii gosudarstvennogo universiteta imeni Chernyshevskogo.
(Hydrocarbons) (Peat)

ARBUZOVA, V.A.

Biological properties of Breslau cultures isolated during recent years. Zhur.mikrobiol.epid.i immun. no.4:79 Ap '54. (MLRA 7:5)

1. Iz Leningradskogo instituta epidemiologii, mikrobiologii i gigiyeny im. Pastera. (Bacteria, Pathogenic)

ABRUZOVA, V. A.

ABRUZOVA, V. A.: "Material on the biological characteristics of the Breslau bacillus and certain epidemiological properties of the contemporary Breslau salmonella." Sci Res Inst of Epidemiology, (Dissertation for the Degree of Candidate in Biological Sciences).

SO: Knizhnaya Letopis', No 23, 1956

USSR/Microbiology - Microorganisms Pathogenic to Humans and Animals F-3

Abs Jour: Ref Zhur - Biol., No 18, 1958, 81506

Author : Arbuzova, V.A.

Inst : -

Title : Data on the Biological Characterization of Breslau Bacillus and Some Epidemiological Characteristics of Current Breslau Salmonellosis. Report 1. Biological Characteristics of Weakly Pathogenic Cultures and the Interrelationships Between Them and the Typical Breslau Bacillus.

Orig Pub: Zh. mikrobiol., epidemiol. i immunobiologii, 1957, No. 8, 101-105

Abstract: Biological properties of 862 cultures of Breslau bacillus (BB) were studied, isolated

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USSR/Microbiology - Microorganisms Pathogenic to Humans and Animals F-3

Abs Jour: Ref Zhur - Biol., No 18, 1958, 81506

in Leningrad in 1950-1954, which caused unique clinico-epidemiological affections without toxic infections. More than 50% of the cultures isolated proved to be weakly pathogenic to mice when infected orally, not causing any deaths but only a generalized infection with subsequent self-cleansing of internal organs from the causative agent. Morphologically, culturally, and in their antigenic structure these cultures were identical with typical BB, but differed from them in their capacity to ferment inositol and in greater variability in developing somatic antigen I. It was shown that the relationship to inositol and pathogenicity to mice did not change in BB of both groups after prolonged storage under laboratory environments (up to

Card 2/3

USSR/Microbiology - Microorganisms Pathogenic to Humans and Animals F-3

Abs Jour: Ref Zhur - Biol., No 18, 1958, 81506

3 years) as well as after long holding in human or mouse organisms. In intraperitoneal infections these culture differed little from typical BB in their pathogenicity. The author assumes that the weakly pathogenic cultures present changed variants of typical BB due to its adaptation to the human organism. -- M.Ya. Byoarskaya

Card 3/3

ARBUZOVA, V.A.

Material on biological characteristics of Salmonella breslau and certain epidemiological characteristics of present-day Salmonella breslau infection. Report No.2: Some epidemiological characteristics of present-day Salmonella breslau infection. Zhur.mikrobiol.epid. i immun. no.1:37-40 Ja '58. (MIRA 11:4)

1. Iz Instituta epidemiologii, mikrobiologii i gigiyeny imeni Pastera.
(SALMONELLA INFECTIONS, epidemiology,
breslau (Rus)

ARBUZOVA, V.A.

Epidemiological and microbiological characteristics of contemporary salmonellosis. Trudy Len.inst.epid. i microbiol. 18:317-328'58. (MIRA 16:7)

1. Iz laboratorii kishechnykh infektsiy Leningradskogo instituta epidemiologii, mikrobiologii i gigiyeny imeni Pastera (zav.E.M. Novgorodskaya)

(SALMONELLA INFECTIONS)

ARBUZOVA, V.A.

Data on the characteristics of gasless Salmonella variants. Trudy Len.inst. epid. i mikrobiol. 21:185-195'60.
(MIRA 16:6)

1. Iz laboratorii khishechnykh infektsiy Leningradskogo instituta epidemiolgoii, mikrobiologii i gigiyeny imeni Pastera.
(SALMONELLA)

ARBUZOVA, V.A.

Biological characteristics of Salmonella isolated from permanent carriers. Trudy Len.inst. epid. i mikrobiol. 21: 196-209'60 (MIRA 16:6)

1. Iz laboratorii kishechnykh infektsiy Leningradskogo instituta epidemiologii, mikrobiologii i gigiyeny imeni Pastera.
(SALMONELLA)

ARBUZOVA, V.Al

Some data on the epidemiological characteristics of Salmonella infections in Leningrad. Zhur. mikrobiol. epid i immun. 31 no.6:124-126 Je '60. (MIRA 13:8)

1. Iz Instituta epidemiologii, mikrobiologii i gigiyeny im. Pastera. (LENINGRAD—SALMONELLA)

ARBUZOVA, V.A.

Characteristics of a Salmonella reservoir among human subjects.
Zhur. mikrobiol. epid. i immun. 31 no.7:130-133 Jl '60.
(MIRA 13:9)

1. Iz laboratorii kishechnykh infektsiy Instituta im. Pastera, Leningrad.
(SALMONELLA)

ARBUZOVA, V.A.

Report No.2: Course of an experimental infection caused in white mice by the cultures of Bracillus breslau. Trudy Len. inst. epid. i mikrobiol. 21:148-163'60. (MIRA 16:6)
(SALMONELLA INFECTIONS)

ARBUZOVA, V.A.

Current methods of Salmonella identification. Report No.2: Results of the study of cultures difficult to identify. Zhur. mikrobiol., epid. i immun. 40 no.2:8-13 F '63. (MIRA 17:2)

1. Iz Leningradskogo instituta epidemiologii i mikrobiologii imeni Pastera.

EXCERPTA MEDICA Sec.4 Vol.11/4 Med.Microb. etc. April58

1070. A COMPARATIVE STUDY OF THE IMMUNITY RESULTING FROM PERCUTANEOUS AND SUBCUTANEOUS ADMINISTRATION OF LIVE BRUCELLOSIS VACCINE (Russian text) - Arbuzova E.I. - SOVET. ZDRAVOOKHR. KIRGIZII 1956, 5 (56-59)

Comparison of immunological reactions as observed on guinea-pigs shows the advantages of using large doses of vaccine (10 milliards of organisms) percutaneously. After percutaneous and subcutaneous administration of the vaccine immunological changes peculiar to brucellosis were observed. The degree of resistance of guinea-pigs to brucellosis was the same irrespective of whether the vaccine was administered subcutaneously (1 milliard organisms) or percutaneously (10 milliard organisms). Percutaneous administration of one to two milliards of

organisms did not lead to development of immunity of the required high order. The efficacy of percutaneous vaccination using a suspension of 10 milliard organisms was proved by the revaccination test. Percutaneous technique is recommended for practical use. (S)

ARBUZOVA, Ye. I. Cand Med Sci -- (diss) "Comparative study of immunizing properties of live brucellosis vaccine from strain VA during cutaneous and subcutaneous administration."
Alma-Ata, 1957. 15 pp 22 cm. (Inst of Physiology, Marginal Pathology and Surgery, Acad Sci Kazakh SSR). 110 copies. (KL, 10-57, 104)

ARBUZOVA, YE. M.

23395. Opredeleniye glitserina v sukhikh vinakh. Vinodeliye i vinogradarstvo SSSR, 1949, No. 7, c. 29-31.

SO: LETOPIS NO. 31, 1949.

ARCADIE, A.

ARCADIE, A. Recommendations concerning the point system for quality of products in the vegetable, fruit, and meat preserves industry. p. 34. Vol. 7, no. 10, Oct. 1955. INDUSTRIA TEXTILA, Bucuresti, Rumania.

SOURCE: East European Accessions List (EEAL) LC Vol. 5, No. 6 June 1956

RUMANIA/Electronics - Vacuum Technique H-9

Abs Jour : Ref Zhur - Fizika, No 7, 1958, No 16124

Author : Arcan L., Bally D., Birsan I.
Inst : Not Given
Title : Magnetic Manometer for Large Range of Pressures

Orig Pub : Studii si cercetari fiz., 1957, 7, No 1, 85-89

Abstract : Description of a magnetic manometer, whose operating principle is analogous to the Penning manometer, but having several advantages over the latter, namely an increased sensitivity (thanks to a considerable increase in the mean free path of the electrons), a larger range of measured pressures (10^{-4} to 10^{-8} mm mercury). The higher sensitivity of the manometer makes it possible to use it as a leak detector in vacuum apparatus.

The manometer is a diode having electrodes of special construction. The anode is a filament located along the axis of a cylindrical cathode. The space between the two is subdivided into several sections by means of disks (0.1 mm thick)

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ARCAN L.

CZECHOSLOVAKIA/Electronics - Vacuum Technique H-9

Abs Jour : Ref Zhur - Fizika, No 3, 1958, No 6448

Author : Arcan L., Bally D.
Inst : Not Given
Title : Trap for Metallic Vacuum Apparatus

Orig Pub : Studii si cercetari fiz., 1957, 8, No 1, 9091

Abstract : Description of the construction of a trap for oil in metallic vacuum apparatus with dismountable X-ray tubes, consisting of a Dewar flask of copper sheet 1 mm thick, mounted on a steam-jet pump. The diameters of the internal and external bulbs are 110 and 120 mm respectively. The internal bulb is secured with the aid of 8 mm rod on the oil trap of the pump. The X-ray tube is connected to the trap below the internal bulb. The great distance between the X-ray and the liquid nitrogen insures a constant tube temperature.

Card : 1/1

ROMANIA

BLUM, I.; BIRCA-GALATEANU, D.; NISTOR, I.; ARCAN, E.

Bucharest, Revue d'Electrotechnique et d'Energétique, No 1, Série B, 1963, pp 103-111

"The Infrared Spectrum of Bituminous Coal of the Valea Jiului."

ARCAN, L.; BELLU, A.

Electron microscope study of the structure formation process of some types of loess. Studii geotehn fund constr hidro 7:255-286 '64.

ARCAN, Lelia; KINSKY, I.

Influence of mineralogical composition of clay on the water-clay suspensions. Petrol si gaze 12 no.9:385-391 S '61.

(Clay) (Water) (Suspensions)

ARCHAKOV, Yu.I., kand.tekhn.nauk; TEODOROVICH, V.P., kand.khimicheskikh nauk

Initiation of the hydrogen corrosion of steel. Khim.mash. no.2:35-38 Mr-Ap '61. (MIRA 14:3)

(Steel—Corrosion)
(Hydrogen)

BLUM, I.; BIRCA-GALATEANU, D.; NISTOR, I.; ARCAN, L.

Infrared spectrum of the Valea Jiului bituminous coals.
Rev electrotechn energet B 8 no.1:103-111 '63.

ARCAN, M.

Exact Determination of the Difference between the Principle Tensions by Photoelasticity Measurements with the "Coker" Compensator. Studii Si Cercetari De Mechanica Aplicata (Studies and Research in Applied Mechanics), #1-2:181:Jan-Jun 55

ARCAN, M.; NICOLAU, E.

Graphic method of separation of principal tensions in photoelasticity, p. 491. Academia Republicii Populare Romine. Institutul de Mecanica Aplicata. STUDII SI CERCETARI DE MECANICA APLICATA. Bucuresti. Vol. 6, no. 3/4, July/Dec. 1955.

So. East European Accessions List Vol. 5, No. 9 September, 1956

ARCAN, M.

Exact determination of the difference of principal tensions through photoelasticity by means of the Coker compensator. p. 181. STUDII SI CERCETARI DE MECANICA APLICATA. Bucuresti. Vo. 6. No. ½. Jan/June 1956

SOURCE: EEAL LC Vol 5, No. 11, Nov. 1956

ARCAN, M.

ARCAN, M.; DRAGHICESCU, D.

ARCAN, M.; DRAGHICESCU, D. One hundred years since the birth of P.S. Iasinskii. p. 705.

No. 12, 1956.
INDUSTRIA CONSTRUCTIILOR SI A MATERIALELOR DE CONSTRUCTII.
TECHNOLOGY
RUMANIA

So: East European Accession, Vol. 6, No. 5, May 1957

ARCAN, M.; STOENESCU, F.; MIHAIL, R.

Studies regarding the introduction of Dinox F 110, a new material for models in the field of photoelasticity. p. 1133.

Academia Republicii Populare Romine. Institutul de Mecancia Aplicata. STUDII SI CERCETARI DE MECANICA APLICATA. Bucuresti, Rumania. Vol. 8, no. 4, 1957.

Monthly list of East European Accessions (EEAI) LV, Vol. 8, no. 8, Aug. 1959

Uncl.

24.4100

80416

RUM/8-59-1-9/24

AUTHORS: Bălan, St., Răutu, S., Arcan, M., Petcu, V.

TITLE: Study of the Behavior of Constructions by Experimenting With Mockups From Plastic Materials \

PERIODICAL: Studii si Cercetări de Mecanică Aplicată, 1959, Nr 1, pp 151 - 172 (RUM)

ABSTRACT: A new method of experimentation with reduced scale mockups has been developed for the studies and calculations of new construction types. The mockups can be made from the same material as the prototype or from some other material. The authors first pose the problem of similarity, indicate with "m" the elements of the mockup and with "p" that of the prototype, and establish the following scales:

scale of lengthes: $\ell_m = \frac{1}{\lambda} \ell_p$ (1);

scale of time: $t_m = \frac{1}{\tau} t_p$ (2);

scale of unitary power: $\sigma_m = \frac{1}{\alpha} \cdot \sigma_p$ (3);

scale of move: $\sigma_m = \frac{1}{\beta} \cdot \delta_p$ (4);

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Study of the Behavior of Constructions by Experimenting With Mockups From Plastic Materials

scale of elasticity modules: $E_m = \frac{1}{\gamma} \cdot E_p$ (5).

Each mockup is made for a certain type of stress, and the problems of similarity have to be examined only for the respective stress. The relations thus become more simple and easier to be solved. The authors then study the cases of a mockup made from the same material as the prototype, where $E_m = E_p = E$ and $\gamma = 1$: a) Static stress in the elastic zone: If the mockup is stressed only by external load, the relations between the mockup values and prototype values are:

$$p_m = \frac{1}{\alpha} p_p; \quad \varepsilon_m = \frac{1}{\alpha} \cdot \varepsilon_p; \quad P_m = \frac{1}{\alpha \cdot \lambda^2} P_p; \quad \delta_m = \frac{1}{\alpha \lambda} \cdot \delta_p \quad (6).$$

If the stresses which provide from the proper weight are not neglectable, they have to respect the similarity relation: $G_m = \frac{1}{n\gamma} \cdot G_p$, thus $\alpha = n$. This case is not advantageous since the displacements are very small and difficult to be measured. In case the proper weight has to be considered, the similarity relations are:

Card 2/11 $$p_m = \frac{1}{\lambda} p_p; \quad \varepsilon_m = \frac{1}{\lambda} \cdot \varepsilon_p; \quad P_m = \frac{1}{\lambda^3} \cdot P_p; \quad \delta_m = \frac{1}{\lambda^2} \cdot \delta_p \quad (7)$$

Study of the Behavior of Constructions by Experimenting With Mockups From Plastic Materials

b) Static stresses at heavy axial loads: The deformation scale has to be the same as the scale of the length: $\frac{1}{\alpha\lambda} = \frac{1}{\lambda}$, $\alpha = 1$

and the similarity relations become:

$$p_m = p_p; \quad \varepsilon_m = \varepsilon_p; \quad P_m = \frac{1}{\lambda^2} P_p; \quad \delta_m = \frac{1}{\lambda} \delta_p \qquad (8)$$

c) Static stresses in the elastic plastical zone: It is necessary that $\sigma_m = \sigma_p$, thus $\alpha = 1$. The similarity conditions are given in this case by the relations (8). d) Dynamic stresses: The inertial powers interfere in this case with the external stresses. Accepting the time (2), the acceleration ratio is:

$$a_m = \frac{\tau^2}{\alpha \cdot \lambda} \cdot a_p \qquad (9)$$

and the inertial power ratio is:

$$\frac{I_m}{I_p} = \frac{m_m \cdot a_m}{m_p \cdot a_p} = \frac{\tau^2}{\alpha \cdot \lambda^4} .$$

Card 3/11 Since all forces which act on the system have to be in ratio with $\frac{1}{\quad}$, the scale of time is: $\tau = \lambda$. (Nr 10). If there are concentrated masses

Study of the Behavior of Constructions by Experimenting With Mockups From Plastic Materials

(M_m, M_p) on the construction, it is necessary that

$$\frac{M_m}{M_p} = \frac{1}{\tau^2 \cdot \lambda} = \frac{1}{\lambda^3} \qquad (11).$$

The authors then proceed to the examination of mockups made from some other material than the prototype. A good material has to be homogeneous and isotropic, to be easily processable, to have a relatively small elasticity module in order to supply easily measurable deformations. a) Static stress in the plastic zone: Using the scale of lengthes (1) and unitary power (3), results for the scales of forces, extension and displacement:

$$P_m = \frac{1}{\alpha \cdot \lambda^2} P_p, \quad \varepsilon_m = \frac{\tau}{\alpha} \varepsilon_p, \quad \delta_m = \frac{\tau}{\alpha \cdot \lambda} \delta_p \qquad (12).$$

The value of α is: $\alpha = \rho \cdot \lambda$ (Nr 13). b) Static load at heavy axial stresses: The similarity can be guaranteed if the influence of the proper weight can be neglected or is replaced by an external stress. By posing the condition:

$$\frac{\delta_m}{\delta_p} = \frac{\ell_m}{\ell_p} = \frac{1}{\lambda},$$

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Study of the Behavior of Constructions by Experimenting With Mockups From Plastic Materials

one obtains the supplementary relation: $\alpha = \gamma$, and the relations:

$$\delta_m = \frac{1}{\lambda}\,\delta_p;\quad P_m = \frac{1}{\gamma\cdot\lambda^2}\cdot P_p;\quad \varepsilon_m = \varepsilon_p;\quad p_m = \frac{1}{\gamma}\,p_p \qquad (14).$$

c) Static stress in the elastic-plastical zone: To obtain a similarity between the bahavior of the mockup and the prototype in the elastic-plastical zone, there is a relation necessary between the elasticity modules of the materials used for the construction of the mockup and prototype (Figure 1):

$$\sigma_m = \frac{1}{\alpha}\,\sigma_p;\qquad E_m(\sigma_m) = \frac{1}{\gamma}\,E_p(\sigma_p) \qquad (15)$$

By knowing the values α and β, the relations between the other parameters are:

$$\varepsilon_m = \frac{\gamma}{\alpha}\,\varepsilon_p,\quad P_m = \frac{1}{\alpha\cdot\lambda^2}\cdot P_p,\quad \delta_m = \frac{\gamma}{\alpha\cdot\lambda}\,\delta_p \qquad (16)$$

d) Dynamic stresses: Knowing the coefficients α, ρ and γ, the acceleration ratio is:

$$a_m = \frac{\gamma\cdot\tau^2}{\alpha\cdot\lambda},$$

Card 5/ 11 an the time scale:

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$$\frac{1}{\tau} = \frac{1}{\lambda}\sqrt{\frac{1}{\rho}\cdot\gamma\cdot} \qquad (17)$$

Experiments with plastic mockups are being carried out in many foreign laboratories. The new plastics allow the observation of the plastified zone by a decoloration of the material. This method has been called "Chromoplasticity". Plastics used for the construction of mockups are polyvinyl-chloride varieties, developed at the Institutul de cercetări chimice "ICECHIM" (Chemical Research Institute) by a team led by State Prize Winner N. Goldenberg. Three plastic varieties have been used: 1) "SDE", 2) "SDP-1", and 3) "SDP-2"; "SDP-3" and "SDP-4". SDE: perfect elastic behavior for $\sigma < \sigma_p$, elasticity module at bending: E = 36,000 kg/sq cm, proportionality limit: σ_p = 550 kg/sq cm, flow limit: σ_c = 600 kg/sq cm. "SDP-1": becomes white if the tensional flow limit has been reached. Elasticity module at bending: 30,000 - 36,000 kg/sq cm, flow limit: at tension: 550 - 700 kg/sq cm, at compression: 600 - 800 kg/sq cm, at bending: 550 - 750 kg/sq cm. The flow limit values within this interval, depend from the thermal treatment of the material. "SDP-2", "SDP-3" and "SDP-4": elasticity module at bending: 20,000 - 35,000 kg/sq cm, flow limit: at tension: 450 - 500 kg/sq cm,

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at bending: 480 - 600 kg/sq cm. The values of the elasticity module and flow, depend from the thermal treatment of the material. "SDP-2", "SDP-3" and "SDP-4" become white at tension and black at compression. The characteristics diagrams of the second and third varieties are very similar to the theoretical diagrams of Prandtl, being almost perfectly elastic for $\sigma < \sigma_c$ and perfectly plastic for $\sigma = \sigma_c$ (Figure 2). The first experiment has been carried out within the Chair of Mechanical Constructions of the Institutul de Constructii (Institute of Constructions) in Bucharest with the "SDE" plastic, by checking the frequency of the proper vibrations of a seven-story frame (Figure 4). The plastic mockup has been built in a scale of 1:30. The concentrated masses have been reduced to 1/40,000 and the time value scale was $t_m = \frac{1}{\text{illegible}} t_p$. The experiments have proved that the hypothesis of the infinite rigid spars of the frame is admissible. New statical computation methods of tower constructions have been checked by another experiment [Ref 2], accomplished with "SDE" material. By using "SDP-1" material, the moment of the appearance of the first plastic joint, the points of the appearance of the joint, their order and the computation of the bearing capacity have been checked by a frame (Figure 6), loaded symmetrically [Ref 2]. Based

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on a computation of G.I. Rozenblat [Ref 3], the appearance order of the plastic joint should be, as shown by Figure 6. According to the calculation of the first order, the breaking load is

$P_r = \frac{8 M_c}{\ell}$, $M_c = 103$ kg. cm, $P_r = 82.4$ kg.

According to the calculation of the second order [Ref 6], the breaking load is $P_r = 72.6$ kg. The real breaking load resulting from the experiment was 76 kg. The results obtained from mockups can be used for the construction of normal size if:

$$\eta = \frac{1}{1 + 1.6\left[\frac{N_1}{P} \cdot \frac{y_1}{\ell} + \frac{N_2}{P} \cdot \frac{y_4}{\ell}\right]}$$

is equal for both, the model and the construction. Since this condition is not satisfied, there is no similarity between the mockup and the construction, which has an influence only upon the bearing capacity. The bearing capacity of the prototype is:

$$P_{rp} = \alpha \cdot \lambda^2 \cdot P_{rm} \cdot \frac{\eta_p}{\eta_m},$$

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representing the influence of the axial loads upon the bearing capacity of the frame. The η coefficient is 0.98 - 0.99 for the prototype and 0.85 - 0.95 for the mockup. In case of a metal prototype with $\lambda = 50$, $E = 2,100,000$ and $\sigma_c = 2,400$, and a mockup of "SDP-1" with $\sigma_c =$ = 550kg/sq cm, $E_m = 36,000$ kg/sq cm, the following result is being obtained:

$$\frac{\eta_p}{\eta_m} = 1.12.$$

The experiment supplies the appearance points of the plastic joint, their order and the bearing capacity. Another experimental frame [Ref 5] is shown by Figure 8. Two mockups have been made, the one from "SDP-2" and the other from "SDP-3". The results are shown by the table on page 162. A series of experiments have been conducted with photoelasticity. Photoelastic mockups are made from "Dinox F-110", an optical active epoxy resin, produced in Rumania [Ref 6]. The behavior of a girder with rectangular holes made of "SDP-1" and of "Dinox F-110" has been studied simultaneously. The authors have examined: a) the bearing capacity; b) the influence of the concentration of tension in the hole corners upon the bearing capacity; c) the regions of entrance into the

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plastic zone; d) the coincidence of these regions with the maximum stress, resulting from the photoelastic mockup. Mockup Nr 1 (Figure 10) has $\frac{L_o}{H} > 5$, thickness 6.5 mm, square-shaped holes with the side $\frac{H}{3}$, dimension of solid section $\frac{H}{3}$ x 6.5 mm. Mockup Nr 2 (Figure 11) had $\frac{L_o}{H} > 5$, thickness 6.5 mm, rectangular holes with $\frac{H}{2}$ base and $\frac{H}{3}$ height, dimension of solid section $\frac{H}{7}$ x 6.5 mm. The experimentation with mockup Nr 1 has proved that the loss of the bearing capacity of the bar was due to the unitary forces of tension in the lower section, in the region of the two central solid sections. Figure 12 shows the distribution of the tension in the elastic field. Accomplishing the calculations, P = 112 kg, at which the plastification has appeared, thus resulting for the "SDP-1" mockup: σ = 530 kg/sq cm. The calculation of the unitary tension force has been accomplished by considering the value of the material band: $\tau_{0,1}$ = 5.25 kg/sq cm/cm. The thickness of the mockup from "Dinox-110" was 5.5 mm and the power by which the isochromatic table has been established was P = 18.7 kg. The maximum tension has appeared not in the mainly stressed middle section but in the solid section. The experiment with mockup Nr 2 has proved that the loss of the bearing capacity was due to the shearing of the solid section (see Figure 11). Regarding the bearing capacity, the loss has been produced at

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the mockup Nr 1 at P = 125 kg and at mockup Nr 2 at P = 100 kg. Other experiments have been conducted with a curved bar exerted to horizontal symmetric forces (Figure 15) and a frame exerted to a horizontal force. Plastic materials allow a study of a wide range of problems, regarding the kind of loss of the bearing capacity. Chromoplasticity makes the direct detection of plastic deformation zones possible which cause the rupture. The experimental results have been checked by theoretical calculations and photo-elastical experimentations. Chromoplastic experiments are very simple and can be accomplished without special devices, except the load arrangement.

There are: 22 photographs, 2 diagrams, 2 graphs and 6 references, 5 of which are Rumanian and 1 Russian.

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